NOTE: VERIFY REVISION - If you have already read this current revision (listed on bottom of page), simply sign the logbook -- reading this current revision again is not required.

Paducah Gaseous Diffusion Plant Site Access Orientation Handbook (for visitors)

USEC
A Global Energy Company

**** YOU MUST LISTEN TO THE ALARMS BY DIALING 7339 ****

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INTRODUCTION

Welcome to the Paducah Gaseous Diffusion Plant. Reading and understanding this orientation handbook is mandatory for all non-site employees, and must be completed prior to receiving access to this facility.

This handbook is provided as a reference to be used during your visit. It identifies specific programs that workers are involved with daily. Being familiar with the requirements of these programs will enable you to knowledgeably and safely work at or visit the Paducah facility.

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TABLE OF CONTENTS

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SAFETY

Safety of our employees and visitors is the number one priority at the Paducah Gaseous Diffusion Plant.

VEHICLES

PGDP Rules of the Road

- Vehicles will be operated by authorized and licensed drivers.
- The speed limit is 25 mph inside the security fence (lower speed limits are posted, as required, in congested areas). Speed limits, barricades, and other postings will be obeyed.
- All operators and occupants of any vehicle used on company business must use seat belts.
- Right-of-way will be yielded to pedestrians, emergency vehicles, and cylinder handlers.
- Vehicles must not be driven inside buildings without special permission from the building's supervisor-in-charge.
- Pedestrians have the right-of-way and must cross in the designated crosswalks.
- Occupying a plant road with an oncoming cylinder hauler requires the operator of the vehicle to stop and pull over to one side, slow forward progress to a bare minimum, or take an alternate route due to the size of the cylinder and cylinder handler, and the potential hazard represented by an incident. Alternate routes will be used when cylinders are being loaded or unloaded.
- Vehicles will be inspected daily by the operator and in proper condition prior to use at PGDP.
- Headlights will be used at night, during twilight, and during inclement weather.
- Windows will be free of frost, dew, dirt, etc., which could impair the operator's vision.
- Loads will be secured.
- Turn signals will be used.
- Parked and unattended vehicles will be turned off and transmission placed in park for automatic and in gear for manual. Tractor-trailers and similar large trucks may be occupied and have the engine running with the brakes set while stopping for activities such as registering and being inspected at entrance gates. The wheels must be chocked if:
  - the roadbed is inclined away from the dock.
  - the truck is entered with power equipment.

In the event of an accident on plant property, prompt notification will be given to the Plant Shift Superintendent (Alpha 1 on plant radio or 6333 bell phone system) and Industrial Hygiene and Safety (6238).

Failure to follow the above rules can have you and/or your company removed from the plant, up to and including permanent removal.

PERSONAL PROTECTIVE EQUIPMENT

Plant visitors must comply with posted signs requiring specific types of personal protective equipment before entering certain areas of the plant. Safety glasses, hard hats, hearing protection, and/or safety shoes will be provided for your use when needed to enter these areas.

Signs are posted to specify the types of personal protective equipment listed below that are required in areas of the plant such as:

* Eye protection
* Head protection
* Safety shoes
* Hearing protection
* Hand protection
* Respiratory protection.

Everyday dress provides protection against many hazards; therefore, you are expected to dress sensibly.

NOTE: Company-issued clothing (e.g., blue coveralls or shoes) shall NOT be worn outside the plant perimeter. Company-issued clothing may NOT be worn over personal garments into contamination control zones. Any exceptions must be approved by the Radiological Protection Manager.

Exception: Groundwater sampling personnel are exempt from the above rule for off-site well monitoring only.

INJURIES/ACCIDENTS

If during the course of your visit, you are injured or involved in an accident, notify your escort and the Health Services Department immediately.

If emergency assistance is required, call 333 BELL or 555 PAX and describe the nature and location of the emergency.

INDUSTRIAL HYGIENE

The Industrial Hygiene and Safety Department is concerned with your health and safety. There are several areas of concern for visitor protection that this department is responsible for:

- Hearing Conservation
- Lead Protection
- Confined Space Entry
- Respiratory Protection
- Hazard Communication Program

HEARING CONSERVATION

An important program managed by Industrial Hygiene and Safety is the Hearing Conservation

Program. This is a program that is designed to protect individual's hearing from the affects of noise. All hazardous noise areas and operations are posted, as such, and approved hearing protection devices are available, when required. If hearing protection devices are not available at that location, contact the Industrial Hygiene and Safety Department for the appropriate equipment.

Note: If you have a severe hearing loss, notify your company representative. This representative may be your escort. This is extremely important -- such hearing loss could prevent your hearing emergency alarms or P.A. announcements.

LEAD PROTECTION

Areas that are above the permissible lead exposure limits are posted with an orange and black sign. Only authorized (trained) lead workers can enter these areas.

CONFINED SPACE ENTRY

There are areas in the plant that may be posted as a confined space entry hazard. Areas such as tanks, rail cars, pits, vaults, open trenches or excavations, tank dikes, etc. These areas have the potential for dangerous levels of chemical or flammable vapors or for an absence of oxygen. Never enter any area where such potential conditions exist.

RESPIRATORY PROTECTION

Respiratory protection is required for various jobs around the plant. Individuals may perform tasks that require such protection only after passing a medical exam, attending a training class, and successfully passing a quantitative fit test. Areas where this protection is required will be posted. Do not enter areas where employees are wearing respiratory protection.

HAZARD COMMUNICATIONS

Hazardous materials in the plant will be properly labeled. If you have any questions about a hazardous material, ask your point-of-contact or escort.

RADIOLOGICAL PROTECTION

Many activities at the Paducah Plant involve the handling of radioactive materials that emit

radiation. “Radiation can simply be described as energy transmitted in the form of waves or particles. There are two primary types of radiation encountered in our everyday lives, non-ionizing radiation (light, microwaves, radio waves) and ionizing radiation (alpha particles, beta particles, neutrons, gamma rays, x-rays). The Radiation Protection Program at Paducah deals specifically with the hazards associated with ionizing radiation.

SOURCES OF IONIZING RADIATION

The average annual radiation dose to a member of the general population from ionizing radiation is about **360 mrem/year**. This amount is a combination of both natural background and man-made sources of radiation.

Natural background is by far the largest contributor of non-occupational radiation exposure (about 300 mrem/year):

Cosmic radiation – radiation from the sun and outer space.
Terrestrial radiation – naturally occurring radioactive materials (e.g., Uranium, Thorium, Radium, Potassium) in the earth's crust and their associated radioactive gases (e.g., Radon and Thoron).

Man-made sources of radiation contribute to the remainder of the annual average radiation exposure.

Medical exposures (diagnostic x-rays and nuclear medicine).
Consumer products (smoke detectors, and tobacco products).
Fallout from nuclear weapons testing.
Nuclear Industry (nuclear power plants, fuel-cycle facilities, and government sites/labs).

RISKS IN PERSPECTIVE

The risks associated with occupational radiation exposures are very low when compared to the risks associated with other occupations or activities.

Chronic radiation exposure refers to small amounts of ionizing radiation received over a long period of time. Health effects from chronic exposures may occur in the exposed individual or in the future children of the exposed individual and mainly include a **slightly increased risk of cancer**. Genetic effects have been extensively studied in plants and animals, but there have been no genetic effects clearly caused by radiation observed in human populations.
Acute radiation exposure refers to large amounts of ionizing radiation received over a short period of time. An example of an acute radiation dose would be the extreme exposures received by more than fifty workers during a criticality accident at the Tokaimura Uranium Processing Plant in Japan in September 1999. Observed health effects from that accident have ranged from **no effect to death,** depending upon the dose received.

Only **chronic exposures** are received at PGDP during normal operations.

RADIOLOGICAL HAZARDS AT THE PADUCAH PLANT

Uranium and its daughter by-products (e.g., Thorium and Protactinium) are the dominant radiological hazards at PGDP. Uranium is primarily an inhalation and ingestion hazard.

In addition to Uranium, there are other radionuclides present in substantially smaller quantities. Those most common are listed below:

Transuranics are man-made elements created during the fission process in nuclear reactors. They are those elements that have a higher atomic number than uranium. At PGDP, the elements of most concern are neptunium (Np-237), plutonium (Pu-238, 239, 240), and americium (Am-241). These elements commonly emit alpha radiation similar to uranium. However, since they tend to remain within the body for many years after an intake, special controls are required to maintain exposures As-Low-As-Reasonably-Achievable (ALARA). Transuranics at PGDP are most likely to be encountered in DOE legacy facilities and some waste operations.

Technetium-99 is also a by-product of the fission process but is not considered a transuranic. It is a light element, which emits low-energy beta radiation and is a minor hazard compared to Uranium. Technetium-99 is primarily a contamination nuisance in that it is highly mobile and difficult to decontaminate from surfaces, especially body tissues and hair. The majority of technetium-99 remaining at PGDP is deposited in the higher enrichment sections of the gaseous diffusion cascade and is concentrated in some waste operations.

Both transuranics and technetium-99 were introduced into the plant with recycled uranium (reactor returns) from government facilities such as Hanford and Savannah River from the early fifties through the mid-seventies.

The USEC and Bechtel-Jacobs Radiation Protection Programs both incorporate elements to maintain personnel exposure to technetium and the transuranics ALARA.

ALARA CONCEPT

Maintaining occupational exposure to radiation and radioactive materials **As-Low-As - Reasonably-Achievable (ALARA)** is an integral part of all site activities. There are three basic practices used to maintain exposures ALARA.

Time - Reduce the amount of time spent near a source of radioactivity.
Distance - Stay as far away from the source of radioactivity as possible.
Shielding - Shielding is placed between workers and the source of radioactivity.

Federal law limits radiation exposure to members of the general public (non-radiological workers) and plant visitors to **100 mrem/year**.

RADIOLOGICAL PROTECTION PROGRAM

The Radiological Protection Program, commonly referred to as Health Physics (HP), has been established to implement the ALARA program and protect all employees and visitors from unnecessary exposure to ionizing radiation. If you have a question regarding radiological safety, ask your escort to contact HP.

EMBRYO/FETUS PROTECTION PROGRAM

Management has established a program designed to protect the embryo/fetus from any adverse condition that may be present in the work place. This includes exposure to chemicals and radioactive materials, as well as other industrial hazards. If you are pregnant and wish to participate in this program, contact your supervisor or point-of-contact.

RADIOLOGICAL CONTROLS

The following are some examples of radiological controls established by HP to warn or protect individuals from radiological hazards:

Radiological Postings are established in areas where radiological hazards exist. The postings have a **yellow** background with black or **magenta** writing. Many radiological areas also have a **yellow and magenta barrier (e.g., rope, chain, tape)** indicating a boundary not to be crossed. All radiological postings, labels, and tags also have the standard **radiation symbol (trefoil)**.

Contaminated items are frequently **wrapped in yellow plastic and tagged or labeled** to warn individuals of a radiological hazard. Radioactive materials are stored in posted areas to prevent unnecessary contact. HP requires **personal protective equipment (PPE)** be worn in specific radiological areas. Examples of anti-contamination PPE include a yellow cloth hood and coveralls, rubber shoes covers and gloves, and respiratory protection devices. PPE requirements are listed on a **Radiological Work Permit (RWP)**.

If you are required to enter a posted radiological area, your escort will also help you obtain the appropriate exposure monitoring devices. PGDP uses a **thermoluminescence dosimeter (TLD)** to monitor radiation exposure externally. If you are assigned a TLD, wear it face out on the front of your chest. If your TLD becomes damaged or lost, contact HP immediately. When exiting the plant, leave your TLD with Security or your escort.

When exiting certain radiological areas, monitoring may be required. This monitoring is required to ensure radioactive material is not spread into clean areas. Your escort or HP can help you with required monitoring. If the instrument alarms, follow the instructions of your escort or HP.

To enter posted radiological areas, you must be properly prepared and informed. You must wear your TLD, appropriate protective clothing, and remain with your escort at all times. They can brief you on specific precautions associated with the area you are visiting.

ACCESS RESTRICTIONS

Escorted individuals may be allowed access to Radioactive Material Areas, Fixed Contamination Areas, Contaminated Debris Areas and Contaminated Control Zones **not to exceed 5 working days** without prior approval from Health Physics.

Escorted individuals will **not** be allowed access to Contamination Areas, High Contamination Areas, Airborne Radioactivity Areas and Radiation Areas without prior approval from Health Physics.

Approval will only be given on a case-by-case basis.

General Employee Training is required for **unescorted** access to the Controlled Access Area (inside the Security Posts).

Rad Worker I Training is required for **unescorted** access to Radioactive Materials Areas, Contamination Control Zones (except for cell floor), Restricted Areas, and Contaminated Debris Areas.

Rad Worker II Training is required for **unescorted** access to the cell floor, Contamination Areas, High Contamination Areas, Airborne Radioactivity Areas, Soil Contamination Areas and Radiation Areas.

EMERGENCY ACTIONS

If an emergency is declared in a radiological area in which you are working, stop work and evacuate the area as directed by announcement or your escort. **Do not** remove PPE or perform any monitoring if you are required to evacuate the area. If this situation occurs, go to the designated assembly point and contact HP for assistance.

VISITOR RESPONSIBILITIES

1. Utilize the ALARA principles of time, distance, and shielding when working near radioactive materials.
2. Comply with radiological safety instructions provided by HP, RWP, procedure, or your escort.
3. Do not handle radioactive material, without additional radiological worker training or a qualified escort.
4. Do not enter any posted radiological area, without additional radiological worker training or a qualified escort.
5. Obey all radiological postings.

6. Wear dosimetry as directed by procedure, HP personnel, or your escort.
7. Contact HP to evaluate the radiological conditions prior to working above 6' in any radiological area or performing any excavation within the Controlled Access Area (CAA).
8. Immediately report any unusual radiological conditions to HP, management or your escort.

HP POINTS-OF-CONTACT

If you have any questions related to radiological matters, if you need assistance, or if you wish to report an unusual radiological condition please contact HP at the locations listed below:

Bechtel-Jacobs or in DOE retained facilities, contact Bechtel-Jacobs HP at **BELL 5043**.

USEC or in USEC leased areas, contact USEC HP at **BELL 6411**.

Do not approach or enter any building if a Radiation Warning light on the building is on.

Cooperating with emergency personnel who are managing activities during an emergency is imperative for your safety.

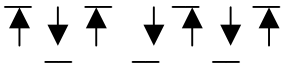
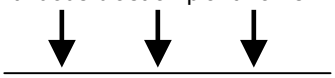
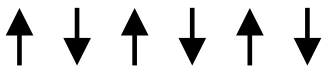
At PGDP, in the event of a plant personnel accountability check, you are to report to your line supervision. As a visitor, your escort or point of contact is responsible for reporting your name to supervision.

If at any time you are on the plant site and you observe a hazardous material release, you should immediately leave the area and report the release to the Plant Shift Superintendent in C-300 at 441-6333.

EMERGENCY PREPAREDNESS

ALARMS

In the event that an incident should occur while you are on the plant site, you will need to be familiar with the audible alarm signals. Please note the instructions. The alarms are listed on the back of the site access card.

PLANT AND LOCAL EMERGENCY SIGNALS		
HI-LO TONE		This tone means emergency conditions exist on the plant site. These tones will be followed by instructions for the plant emergency response organization and any protective actions required for the plant population.
EMERGENCY RADIATION SIGNAL	Continuous blast on special high-pitched air whistle or electronic horns 	Upon hearing the sound of a high-pitched air whistle or electronic horn, you should rapidly leave the area, stay away from the affected buildings, and report immediately to your designated assembly point.
TAKE COVER WARNING	Intermittent 2-second blasts	This sound indicates a tornado warning. You should immediately take cover in the nearest take cover area.
EVACUATION SIGNAL	Continuous blast on plant horns 	This signal means that possible emergency conditions exist. You should evacuate to your designated evacuation point or follow the instructions provided by the plant shift superintendent over the plant PA system.
CASCADE BUILDINGS LOCAL ALARMS	3 blasts on building horns or howlers	Upon hearing three blasts on the cascade building horns, you should call the respective area control room immediately. If no answer, call C-300 at 6211.
BUILDING EVACUATION C-100, C-360, C-710, and C-720	Continuous blast on building horns	Upon hearing this sound, you should evacuate to your designated evacuation point or follow the instructions provided by the plant shift superintendent over the plant PA system.
THE COMMUNITY WARNING SIREN	Continuous wail on off-site sirens 	This sound means a condition on the plant site may affect the surrounding community. The public should shelter in-place and listen to their local emergency alert system radio or television station. Personnel outside the plant on the DOE reservation or on the West Kentucky Wildlife Management Area shall evacuate the area immediately.

Note: All visitors must review the alarms by dialing 339 PAX or 7339 BELL.

ALARM RESPONSE

Buildings that contain uranium or other fissionable materials have Ruby Red Radiation Warning lights on the building exterior. If you evacuate one of these buildings, and the radiation Warning light is "on" and/or rotating, report to your designated Assembly Point (shown in table below).

ASSEMBLY POINTS

Personnel			Assembly Point	Point Location
C-331	C-337	C-337-A	1	C-631 Pumphouse
C-337-T1	C-337-T2	C-754-A		
C-360	C-360-T1	C-360-T2		
C-637	Post 47C-331/C-410 Tie			
HP mobile office structure (north of Post 47)				
IM mobile office structure (north of Post 47)				
C-408	C-409	C-729	2	C-200 (northwest corner)
C-709	C-710			
C-710-A	C-710-10 (Boundary Control Station)			
C-720 (east side)	C-711			
C-720-A	C-720 (south side)			
C-720-B	C-720-J			
C-720-K	C-720-M			
C-720-M-T1	C-720-M-T2			
C-720-R	C-720-S			
C-721	C-728			
C-310	C-310-A	C-333-T5	3	C-304
C-310-B	C-310-C	C-333-T6		
C-310 (sprinkler vault)		C-333-T7		
C-333 (west area)		C-727		
C-720 Receiving dock area			4	C-720-G
C-723	C-720-C	C-720 (west side)	5	C-744
C-335	C-350	C-410-D	6	C-635-1 Pumphouse
C-400	C-400-A	C-410-K		
C-402	C-410	C-411		
C-415	C-420	C-754		
C-335/C-410 Tie				
C-333-A	C-333 (east area)		7	C-533-1 Switchhouse Parking Area
C-746-Q	C-746-Q1	C-746-Q-T1		

SECURITY

Regarding security, there may be a special briefing given to visitors depending on the areas needing to be visited. An individual must have a "Q," "L," or escort-required pass before entrance.

Visitors must report to the building's supervisor-in-charge upon entering a building. This can be done through the point-of-contact or the escort. All uncleared people must always remain in the direct presence of their escort.

PROPERTY PROTECTED AREAS:
(Buildings outside security protected fence)

- Prohibited items: Firearms, illegal drugs, and alcoholic beverages.
- Point-of-contact enters appropriate visitor information on the Visitor Program (e-mail) and assures the individual(s) are logged in and appropriately badged.
- Point-of-contact must coordinate with Computer Security Officer regarding the use of computer equipment and media prior to entry/use.
- Individuals working in Property Protected Areas are subject to search/inspection by local Security/Protective Force.

CONTROLLED ACCESS AREA:
(inside security protected fence)

Uncleared individuals and their escorts must observe the following:

- Uncleared visitor/employee must not have visual access to classified information or material.
- Point-of-contact notifies Security of all visits and enters appropriate information on Visitor Program (e-mail).
- Uncleared visitor/employee must be under continuous audible/visual escort at all times.
- All uncleared visitors/employees must remain within their work areas. Travel to additional plant site facilities will require Security Department approval.
- If escorted to a meeting, the escort must announce the fact that you are an uncleared visitor so that classified information will not be inadvertently discussed in your presence.
- When your escort transfers escort responsibilities to someone else, the original escort must ensure the new escort accepts full responsibilities as your escort.

All visitors must sign a Visitors Register/Log. A picture ID will be required as a proof of identification (e.g., driver's license).

PROHIBITED ITEMS

DOE/USEC has procedures prohibiting certain items in this facility. The following items are prohibited by the Atomic Energy Act of 1954:

- Cameras and film
- Audio or video recorders
- Radio transmitters
- Privately owned cellular phones

- Firearms, ammunition, or weapons
- Explosives
- Controlled substances, illegal drugs, drug paraphernalia, and intoxicants
- Other items prohibited by law
- Computer equipment and computer media are security concerns and are strictly controlled/authorized by the plant Computer Security Officer for use at each site.

NOTE: All data/information/media/imaging material shall have a classification review prior to leaving the controlled access area. This is accomplished by the Plant Classification Officer or an Authorized Derivative Classifier.

PLANT PHONE NUMBERS

EMERGENCY	333-BELL/ 555-PAX (See Note)
Plant Manager	6301
Training Manager	6886
Industrial Safety	6238
Health Physics	6411
Industrial Hygiene	6134
Medical Facility	6266
Respirator Facility	6597
Security Department	6222
Police Department	6246
Fire Department	6031
Plant Shift Superintendent	6211

Note: Dialing 911 will not reach an emergency response.